

# Overview

## Objective

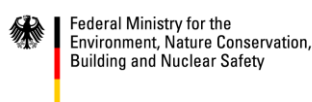
The GIZ project *Policy dialogue and knowledge management on low emission development strategies in the MENA region* is commissioned by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and supports partner countries in implementing low emission and energy strategies and in designing suitable instruments. The project appraises experiences related to low emission strategies from the region and makes them globally accessible to projects carried out by the International Climate Initiative (IKI), which is financed by the German Government.

## Good Practice

The project conducted a good practice analysis of IKI projects in the MENA region. The aim of this analysis was to identify activities which contribute to low carbon development and are also transferable to other MENA countries or other regions. Ten projects have been identified as outstanding examples of good practice in the field of climate projects. For the purpose of valuing and sharing experiences, how to overcome barriers and to enable the project's success, a factsheet for each identified good practice has been designed.

Title	Activity	Area	Country	Implementing Organisation
Creating a regional framework for RE	Supporting the development of the AREF	Policy	Arab Region	GIZ
Developing a strategic menu on mitigation options	Supporting the Government of Egypt in preparing 10 NAMA Information Notes (NINOs)	Policy	Egypt	UNEP
Strengthening capacities for the integration of RE into the electricity grid	Training on the integration of RE into the electricity grid	Capacity Building	Supra-regional/ MENA	RENAC
Increasing EE in Water Supply	Development of Energy Performance Contracting for EE water pumps	Financing	Jordan	GIZ
Promoting science and research for climate friendly technologies	Support to national research activities on climate friendly technologies in MOR	Research	Morocco	GIZ
Establishing local capacities for MRV implementation	Development and implementation of tailor-made sectoral GHG Inventory Systems	Capacity Building	Turkey	GIZ
Facilitating access to international climate finance	Building and Transport NAMAs combined with MRV system for greenhouse gas emissions in Tunisia	Capacity Building	Tunisia	GIZ
Saving electricity in industrial cooling processes	Installation and operation of solar cooling systems with natural refrigerants	EE, RE, Capacity Building	Jordan	GIZ
Advancing sustainable consumption and production	Advancing and measuring SCP for a low-carbon economy in newly industrialized	Capacity Building	Morocco, Chile, Ethiopia, Peru	UNEP
Establishing a climate change competence centre in Morocco	Establishing a climate change competence centre to support national climate related activities	Capacity Building	Morocco	GIZ

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# Creating a regional framework for renewable energies

<b>Activity</b>	Supporting the development of the Arab Renewable Energy Framework (AREF)
<b>Area</b>	Policy
<b>Country</b>	Arab Region
<b>Project title</b>	Support for the Mediterranean Solar Plan and Union for the Mediterranean initiatives
<b>Duration</b>	03/2012 – 12/2014
<b>Partner institution</b>	League of Arab States (LAS)
<b>Implementing organisation</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
<b>Contact</b>	Anita Richter (GIZ), anita.richter@giz.de

## Summary

At the beginning of the project in 2012, despite visible progress, the use of renewable energy (RE) in the MENA region was far behind its possibilities. Therefore the League of Arab States (LAS) sought to advance the deployment of RE in the region. In the context of the International Climate Initiative, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), in cooperation with the Regional Center for Renewable Energy and Energy Efficiency (RCREEE), supported LAS in the development of a regional RE framework. In 2014, the Arab Ministerial Council of Electricity at LAS officially adopted the Arab Renewable Energy Framework (AREF) and the template for National Renewable Energy Action Plans (NREAP). Improved framework conditions such as these can contribute to RE deployment and greenhouse gas mitigation in the long term.

## Initial situation

The countries in the MENA region face the challenge of ensuring their energy supply under the conditions of a foreseeable drastic increase in population and stable economic growth. Although many of these countries possess particularly cost-efficient potentials to generate electricity from RE sources, in the beginning of the project these were hardly used. Reasons for this were insufficient RE incentive systems and barriers for RE deployment.

Already in 2010, LAS had animated its member states to develop National Energy Efficiency Action Plans (NEEAP) similar to those of the European Union (EU). In this process, LAS was supported by two different projects: MED-EMIP (financed by the EU), and RCREEE. The foundation for cooperation between LAS and GIZ was therefore already established. As a regional organization, LAS is primarily interested in regional concepts. The EU, also being a regional organization, was already experienced in this area, which is why cooperation on the project level was sought with an EU member state. Germany was a suitable partner due to its extensive experience in the promotion of RE technologies.



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## Contribution to GHG mitigation

LAS was supported in improving the political structures for the deployment of RE. To this end, a consultant was posted in the energy department of LAS and additionally an experienced external consultant provided. They supported the process to draft the AREF including the template for the development of NREAP, based on the EU Renewable Energy Directive 2009/28/EC. With AREF, a regional planning and monitoring process for RE deployment was introduced. This process complements the Pan-Arab Renewable Energy Strategy, which was adopted by the Arab Socio-Economic Summit in 2013 in Riyadh. In addition, national decision makers from the LAS member states were trained for the implementation of AREF and long term energy planning.

If implemented consequently, AREF and the relevant reporting formats can contribute to benchmarking of RE policies and to knowledge exchange in the region. Thus, in the long term the deployment of RE in the region will be supported and a mitigation of greenhouse gases (GHG) can thereby be achieved. Due to the regional scope and the favourable solar irradiance and wind conditions in the MENA region, a large potential for GHG mitigation through RE deployment can be assumed.

## Success factors

The cooperation with the LAS and the adoption of the AREF as an orientation for drafting RE policies promise a great multiplier effect for the improvement of the framework conditions for RE in the region. Although LAS unlike the EU cannot adopt binding targets, it can create political pressure by introducing planning and monitoring tools (NREAP and progress reports) and a regular exchange between member states. The adoption by the Ministerial Council of Electricity gives a strong legitimacy to any approved document.

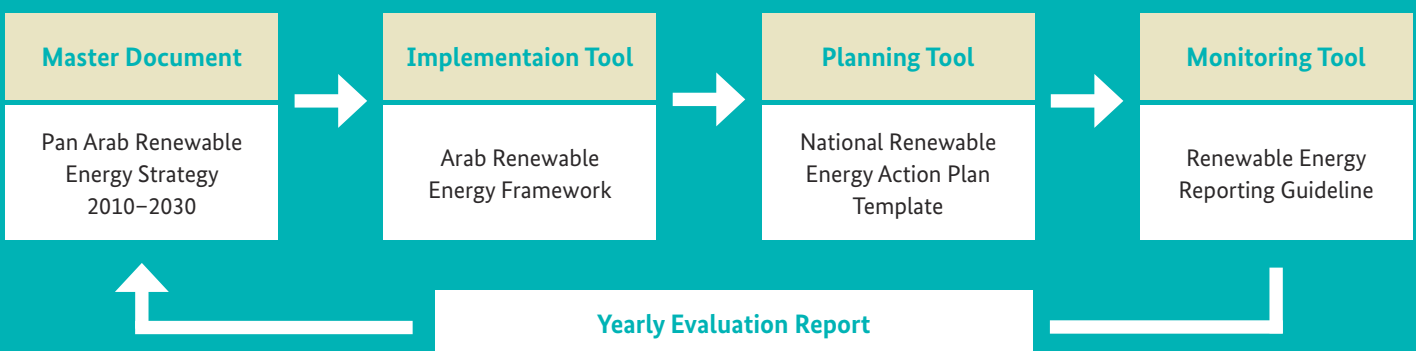
In the context of direct consultancy, the provision for the ownership principle of LAS was received very positively, since LAS itself was responsible for the final choice of the consultants. This approach is also transferable to other regions with similar institutional structures.

## Lessons learned

The development of a standardized reporting framework was complicated by the diverse conditions of the LAS member states concerning energy matters in general (some countries have abundant fossil fuel resources, others are energy importers). Therefore, the possibility to account for already existent efforts was considered necessary. The quantification and verification of the impact of the action plans still presents a challenge. Active involvement of the Ministerial Council of Electricity will be required to urge member states to adopt and implement the NREAPs.



## The Regional RE Policy Development System of LAS-Energy Department



This project has been selected as a good practice by the GIZ project "Policy dialogue and knowledge management on LEDS in the MENA region". Within this framework, ten projects of the International Climate Initiative have been selected in total.



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# Developing a strategic menu on mitigation options

<b>Activity</b>	Supporting the Government of Egypt in preparing 10 NAMA Information Notes (NINOs)
<b>Area</b>	Policy
<b>Country</b>	Egypt
<b>Project title</b>	Low Emission Capacity Building (LECB) Programme
<b>Duration</b>	12/2011 – 12/2016
<b>Partner institution</b>	Egyptian Ministry of State for Environmental Affairs
<b>Implementing organisation</b>	United Nations Development Programme (UNDP), financed by the International Climate Initiative (IKI).
<b>Contact</b>	Susanne Olbrisch, lowemission@undp.org

## Initial situation

Egypt is among the 189 countries that submitted a national climate change plan in contribution to the Paris Agreement. As one of the world's fastest growing countries in terms of population and economy, there is a need to plan a transition towards a resilient low carbon economy. High vulnerability to climate change, on the other hand, threatens its energy, food and water security and undermines its economic competitiveness.

Similar to other countries, Egypt has benefited from the vivid engagement of a wide array of entities on climate change mitigation, including government and non-government agencies, national and international organisations. These actors have been working on a variety of projects often independently from each other. In particular, there was a need to build capacity within government entities to identify and quantify opportunities for GHG emission savings.

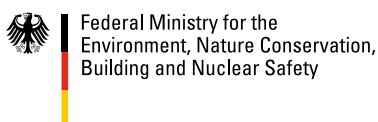
## Summary

The Paris Agreement has catalysed critical momentum for climate action on the side of country governments, non-state actors and donors alike. This has resulted in an increased set of activities, making a coherent approach more important than ever. This case study illustrates the development of a “strategic menu for mitigation options” by the Government of Egypt which facilitates the matching of identified priority actions with funding opportunities.

Ten key topics were identified, for which Information Notes for Nationally Appropriate Mitigation Actions (NINOs) have been developed, including renewable energy, energy efficiency, transport, lighting, buildings, industry, waste, oil, gas and fertilizers. These actions have a high mitigation potential and are expected to significantly contribute to an implementation plan for Egypt's Nationally Determined Contribution (NDC).



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## Contribution to GHG mitigation

Egypt needed to bring its diverse activities within the climate change mitigation area into a coherent framework. To facilitate a comprehensive approach, the Egyptian Government, with support from UNDP's Low Emission Capacity Building (LECB) Programme, developed a "strategic menu on mitigation" with high-potential for emission reductions and associated NAMA Information Notes (NINOs).

The process was based on developing the capacities and prioritizing mitigation activities in ten sectors (see table below) across key line ministries. The inter-agency collaboration was launched through an inception workshop followed by in-ministry capacity building events which were carried out for all ten sectors. Workshops for broad stakeholder engagement reached more than 300 participants.

The NINOs offer a standardized information platform to match mitigation actions with potential funders or investors. They contain a mapping of relevant trends in the sector, the outline of a proposed mitigation activity along with financial analyses and the approach to monitoring, reporting and verification. Interested government and non-government entities can select from these NINOs as a basis for the development of future projects, which will enable higher coherence and thus effectiveness among mitigation projects.

With the expected completion of ten NINOs in 2017, the next step under the Low Emission Capacity Building Project will be to develop up to six NINOs into full NAMAs. This is expected to significantly contribute to an action plan for NDC implementation, and may allow Egypt to accelerate its actions on climate change mitigations.

## Success factors

An important aspect of the development of the "strategic menu on mitigation options" in Egypt has been the broad involvement of all relevant governmental actors, which is coordinated by a dedicated steering committee that was established under the process. The committee is headed by the CEO of Egypt's Environmental Affairs Agency and comprises representatives of various ministries as well as UNDP. A National Team of experts was established at the beginning of the process including experts from the Ministries of Petroleum, Transport, Agriculture, Housing and Planning. This team is responsible for following the UNFCCC negotiations, assessing and surveying mitigation potentials in relevant sectors, and formulating NAMAs.

In addition, other Egyptian stakeholders of diverse societal groups and the private sector have been included in events and capacity building activities to take into account their priorities.

## Lessons learned

Engaging a large range of stakeholders took a considerable amount of time and work as linking up diverse actors with different agendas and establishing mechanisms for exchange required trust and a long-term perspective of common goals. Those who were involved considered this engagement process crucial for the success of this work.

Another key aspect was to align the process with relevant national processes such as the development of Egypt's Third National Communication, the NDCs and the Sustainable Development Strategy (Egypt's Vision 2030). Regular global exchange takes place with other countries participating in the Low Emission Capacity Building Programme.

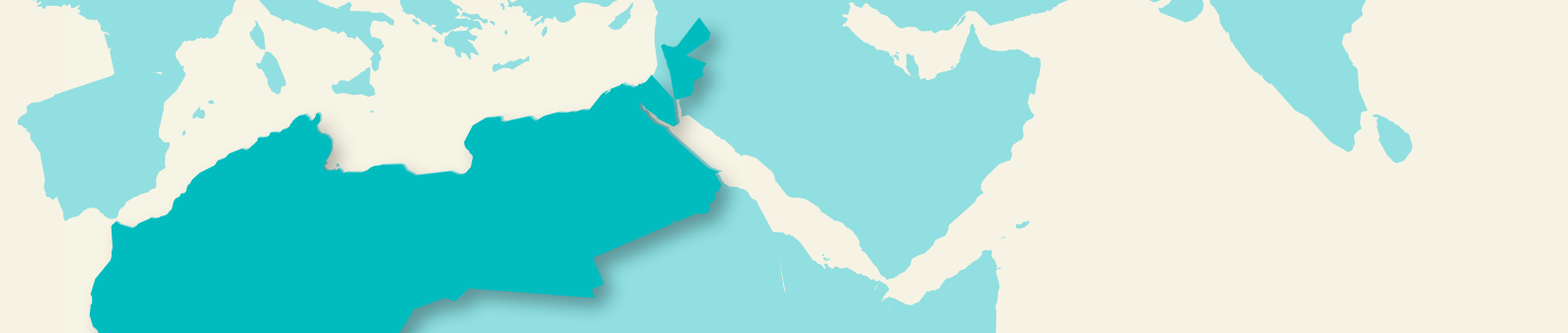
## Overview of the 10 NINOs

NINO No.	Title	Sector(s)
1	Emission Reduction through Waste-to-Energy	Waste
2	Shale Oil-based Power Generation	Oil
3	Energy Efficiency in Residential Buildings	Housing / Energy Efficiency
4	Smart Street Lighting	Urban Planning
5	Gas Flaring	Gas
6	Renewable Energy in Industry	Renewable Energy / Industry
7	Energy Efficiency in Industry	Energy Efficiency / Industry
8	Sustainable Transport	Transport
9	Efficient Lighting in Governmental Buildings	Energy Efficiency / Industry
10	Industrial Processes in Fertilizer / Nitric Acid Industry	Fertilizer / Industry

This project has been selected as a good practice by the GIZ project "Policy dialogue and knowledge management on LEDS in the MENA region". Within this framework, ten projects of the International Climate Initiative have been selected in total.



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# Strengthening capacities for the integration of renewable energies into the electricity grid

<b>Activity</b>	Training on the integration of renewable energy into the electricity grid
<b>Area</b>	Capacity building
<b>Country</b>	Supraregional / MENA
<b>Project title</b>	Training on the integration of renewable energy into the electricity grid in Morocco, Tunisia, Algeria, Egypt, Lebanon, Jordan and Libya (RE-GridSystem)
<b>Duration</b>	12/2010 – 12/2014
<b>Implementing organisation</b>	Renewables Academy AG (RENAC)
<b>Contact</b>	Albrecht Tiedemann (RENAC), tiedemann@renac.de

## Summary

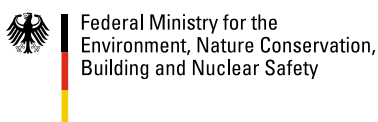
In the framework of the International Climate Initiative, Renewables Academy AG (RENAC) has conducted trainings on the integration of renewable energy into the electricity grid in the MENA region. Thereby, objections concerning the reliability of renewable energies had to be dispelled in the region. With the help of a “blended learning” approach, which combines online activities with classroom seminars, knowledge about the grid integration of electricity from fluctuating energy sources was imparted. A stronger advocacy for renewable energies in the partner countries leads to an increased deployment of renewables in the long term and thereby contributes to mitigating greenhouse gases. The relevance of the trainings and their easy transferability to other contexts account for their high potential for greenhouse gas mitigation in the medium and long term.

## Initial situation

In the MENA region, there had already been first efforts to promote the deployment of renewable energies (RE). However, there was a discrepancy between the political targets for RE deployment and the operative responsibility for electricity generation. The system operators were primarily accustomed to managing large-scale fossil-fuel power plants and perceived renewable energies as unreliable due to their variability. A capacity needs assessment showed that there was a demand for trainings on how to secure a stable electricity supply even with high shares of grid-connected wind and solar power. At this point, there was no systematic training for experts and administration in the energy sector concerning the grid integration of electricity from renewable sources. Basic economic and technological knowledge on the generation technologies however was already present, as there had been some solar and wind projects in a few countries of the region.



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## Contribution to GHG mitigation

With the help of the activity, a knowledge transfer to the partner countries has taken place. The participants in the trainings received practice-relevant information about the operation and long term planning of energy supply systems with high shares of fluctuating electricity generation from wind and solar power plants. Thereby, concerns in the area of engineering against the deployment of RE have been overcome. This has been also confirmed by a follow-up survey for alumni.

Since RE are an essential component of low carbon strategies, this approach will contribute to greenhouse gas mitigation in the medium and long term. Conveying to relevant actors that renewable energies are not a problem in energy supply, but rather a part of the solution, is an essential outcome of the project.

In addition, the activities in the partner countries and the intensive expert exchange encouraged the involved actors to build networks and develop a common understanding for solutions to deploy renewables. This surely is a beneficial dynamic for the further uptake of RE in MENA and other regions and the resulting mitigation of greenhouse gases.

## Success factors

The combination of online activities, classroom seminars, and an additional exhibition has proven to be successful. This blended learning approach has been a decisive success factor. Through the deliberately chosen participants coming from governmental institutions, grid operators, companies and research institutes in the region, knowledge was disseminated in relevant areas in the different partner countries. This is expected to produce a multiplying effect which goes hand in hand with dispelling doubts about the reliability of RE. The self-financing of travel expenses to Germany by the participants contributed to them being motivated and alert.

The high replication potential is apparent since there is already a first subsequent project taking place: In the framework of the International Climate Initiative, RENAC now conducts trainings on grid integration of renewables in Latin America and Southeast Asia. An expansion and transfer also to other regions which are beginning to deploy RE is possible and expedient.

## Lessons learned

During the project implementation, the regular presence of participants in classroom seminars turned out to be a challenge. Taking into account the absence of the participants from their workplace and personal environment during the seminars, RENAC developed online seminars with teaching videos, exercises, text and a forum for question and answers in French and in English. This solution proved to be reasonable for knowledge transfer.

For the online classes, an appealing presentation of the contents was decisive so that the participants actually engaged with the materials. A test at the end of the online seminar with the corresponding certificate "Certified ReGrid Manager (CRGM)" was an efficient incentive for the participants. Almost 200 persons successfully passed the exam.

Future projects could be broadened to involve a stronger focus on the topic of energy efficiency. During the project it became clear that local actors always assumed a constant increase in energy consumption in the future. By specifically supporting energy efficiency measures, this trend could be slowed down. Raising awareness for this topic could thus further contribute to mitigating greenhouse gases.





# Increasing Energy Efficiency in Water Supply

<b>Activity</b>	Development of Energy Performance Contracting for energy efficient water pumps
<b>Area</b>	Financing
<b>Country</b>	Jordan
<b>Project title</b>	Optimization of the energy consumption of water pumping stations in Jordan
<b>Duration</b>	10/2008 – 11/2014
<b>Partner institution</b>	Water Authority of Jordan
<b>Implementing organisation</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
<b>Contact</b>	Bassam Hayek, GIZ, Bassam.Hayek@giz.de Daniel Busche, GIZ, Daniel.Busche@giz.de

stations – more than 200 – are necessary for water pumping (well fields) and water transport (network stations). Pumping and transport of water are very energy intensive in Jordan due to the depth of the ground water reservoirs and their large distances from the consumers. The water sector is one of the biggest consumers of electricity in the country, representing 14% (2000 GWh/year) of overall consumption. About half of this is allotted to pumping activities. Many of the pumps have disproportionate energy consumption and need to be modernized. In order to reduce the financial burden for the public sector, it is vital to involve the private sector in the process of pump modernization. In the framework of the International Climate Initiative, GIZ has therefore designed this project with the aim to increase energy efficiency in water provision.

## Summary

Jordan is characterized by severe water scarcity and unsustainable, energy-intensive ground water use practices. Within the framework of the International Climate Initiative, GIZ has implemented a project to increase energy efficiency in water supply. With the help of two pilot projects, Energy Performance Contracting (EPC) was identified as a suitable business model to finance the modernization of water pumps. EPC in the water sector is well applicable to other countries as well and can achieve efficiency gains of over 30% and thus contribute to a substantial mitigation of greenhouse gases.

## Initial situation

Jordan is one of the most arid countries in the world. Population growth, refugee influx and economic development will further increase water demand in the future. A large number of pumping

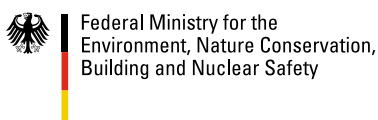
Old pumps



New pumps



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## Contribution to GHG mitigation

In a first step, 25 pumping facilities were analyzed which account for a large part of the energy consumption in the water sector. The modernization of the pumps was then piloted in two projects by applying Energy Performance Contracting (EPC): A large part of the efficiency-raising measures, i.e. investment, maintenance and operating costs, is paid by private Energy Service Companies (ESCOs). Costs are amortized through the achieved energy savings which are shared between the water utility and the ESCo. In order to sustainably reduce the energy consumption of pumping stations, pumps have to constantly consume little electricity throughout their life cycle. From this perspective, EPC is the ideal business model because energy savings need to be achieved during the entire project duration in order to receive payments.

The detailed analysis revealed substantial economization opportunities for the 25 facilities: A reduction of energy consumption by 33.5 %, corresponding to energy savings of 42 GWh annually and avoided CO<sub>2</sub> emissions of over 30,000 t. Based on the energy tariff of the Water Authority of Jordan in 2013, this translates into annual savings of 3.3 million Euro.

## Success factors

As the Water Authority of Jordan wishes to make use of savings potentials preferably everywhere in the water sector, the EPC model presents the opportunity to be applied in a larger setting. With an expected amortization duration of about 2–3 years for individual facilities, private investments and thus further greenhouse gas reductions can be expected. In particular due to the profitable two pilot projects, where EPC models were successfully implemented, the private sector became significantly more involved.

The audits which were conducted upfront provided valid information on savings potentials. Globally, the use of inefficient pumping systems is widespread and the public sector in many

cases does not have the capacity to fund the necessary modernization. Thus, this business model is well suited to be used by projects in other energy efficiency contexts and to contribute to greenhouse gas mitigation. Especially attractive is the fact that energy savings are relatively simple to measure, the project success is therefore easy to communicate.

## Lessons learned

In addition to high efficiency pumps, it is essential to have adequate pumping management including sound maintenance, monitoring and data management.

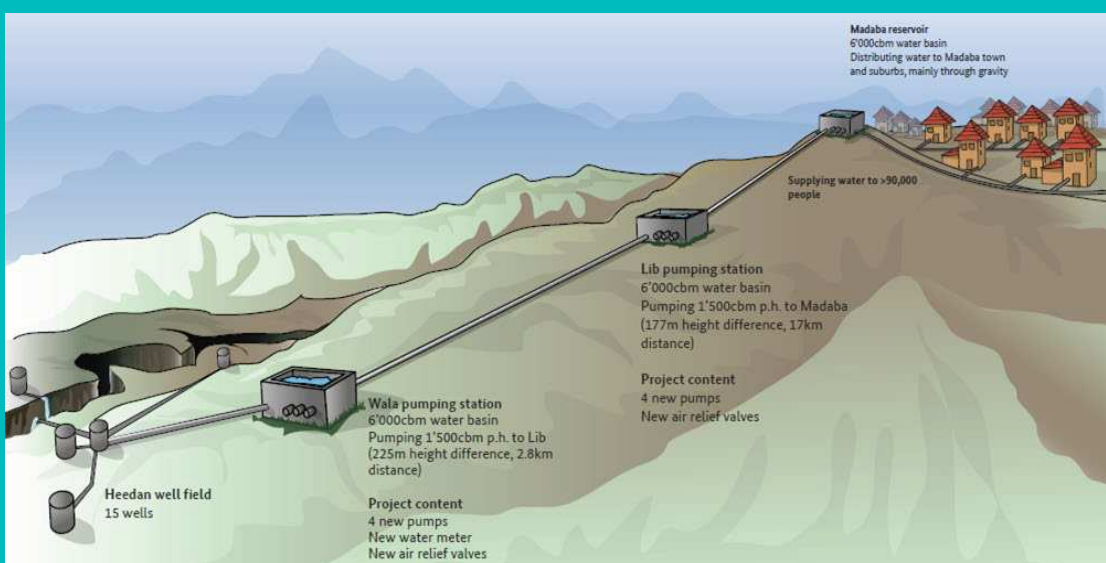
For the private sector to invest in such EPC models, it is imperative to have financing institutions readily available and interested in such projects. As the private sector will seek low interest rate loans to be able to finance such projects, financing programs with suitable conditions at commercial or development banks are needed.

It is also vital to involve a third party for the monitoring and evaluation of pump design and the retrofitting of pumping stations. This will reduce the risks of the private sector and ensure the sustainability of the model.

## Wala/Lib (Madaba) pilot activity

Involves Water Authority of Jordan/Miyahuna and an Energy Service Company (ESCO) formed by Engicon and Wilo taking responsibility of O&M for 5 years.

- Investment = 726'426 EUR (GIZ contribution: 24 %)
- 8 new high quality pumps to improve the specific energy consumption from 1.02 to 0.90 kWh/m<sup>3</sup> in Wala and from 1.1 to 0.82 kWh/m<sup>3</sup> in Lib.
- At 9 Mm<sup>3</sup>/y of pumped water and electricity tariff (0.078 EUR/kWh, in 2013), savings would reach to 280'800 EUR/y
- Reduction in CO<sub>2</sub> emissions = 2'500 t CO<sub>2</sub>/y.



### Wala/Lib (Madaba) pilot activity

This project has been selected as a good practice by the GIZ project "Policy dialogue and knowledge management on LEDS in the MENA region". Within this framework, ten projects of the International Climate Initiative have been selected in total.



**Photos:**  
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# Promoting science and research for climate friendly technologies

<b>Activity</b>	Support to national research activities on climate friendly technologies in Morocco
<b>Area</b>	Research
<b>Country</b>	Morocco
<b>Project title</b>	German Climate Technology Initiative (DKTI I), Morocco
<b>Duration</b>	10/2013 - 12/2017
<b>Partner institution</b>	Institut de Recherche en Energie Solaire et Energies Nouvelles (IRESEN)
<b>Implementing organisation</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
<b>Contact</b>	Fatiha El Mahdaoui, fatiha.el-mahdaoui@giz.de

## Summary

A focus point of the project of the German Climate Technology Initiative (DKTI I) is promoting the area of science and research for climate friendly technologies. Local competencies are developed by supporting diverse activities, like the establishment of a Green Energy Park as a testing platform for solar energy systems and a pilot research project on electric mobility. Given that actors from the private sector and science have been involved, not only a strong knowledge base but also network building between these actors has been achieved. In general, supporting national research activities can be replicated in other countries, leading to greenhouse gas reductions in the long term.

## Initial situation

Morocco possesses a high potential to generate electricity from renewable energy sources and to increase energy efficiency. At the start of the project, this potential was only rudimentarily used.

To reduce the country's strong dependency on imports of fossil energies, national development plans with the target to install 6000 MW wind, solar and hydro power (2000 MW each) were adopted. Installing solar and wind power plants not only requires substantial financial resources, but also the relevant knowledge and capacities. To increase these in Moroccan businesses and research institutes as well as in formation and employment, this project supports the strengthening of capacities of institutions and actors in solar research through a research component in the context of the German Climate Technology Initiative (DKTI).

## Contribution to GHG mitigation

The project activities contribute to strengthening the local capacities in the area of renewable energies and therefore to a long term mitigation of greenhouse gases. This is exemplified by two project activities:

- 1) The Green Energy Park developed by the national research institute for solar energy and renewables (IRESEN) serves as a testing platform for solar energy systems. Diverse modern technical



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equipment is available for testing and demonstration in laboratories and outdoors. In addition to the funding by the Office Chérifien des Phosphates (OCP), international research projects and private sector contributions have added to the technical equipment. As a result, the Green Energy Park contributes substantially to research and education in the area of renewable energy systems and in the long term also to greenhouse gas mitigation.

2) In addition, a pilot research project on the deployment of electric vehicles for social services was supported. In cooperation with Moroccan universities and IRESEN, the Moroccan research institute for renewable energies, research on the optimization of the lifespan of batteries in electric vehicles and on the dissemination of the technology in Morocco has been supported. This contributes to the mitigation of greenhouse gases in the transport sector.

## Success factors

The activities possess a high potential for replication since, in principal, they can be implemented independent of the Moroccan context. Involving a great number of partners considerably contributed to the successful implementation. Not only IRESEN, which already possessed a solid knowledge base on renewable energy technologies, but also other researchers from universities and the private sector were involved in the process which was adapted to their needs. In consequence, the knowledge capacities were developed at a high number and diversity of partners. Surpassing the completion of the project, this can lead to other sectors developing interest in and knowledge on climate friendly technologies. In addition, the approach is very flexible and adaptable to local needs.

## Lessons learned

Intensively involving the private and the research sector is an important requirement for the success of the activity. This ensures that projects are pursued in line with actual practices. One challenge is uniting the different perspectives of science and businesses so that the competency level of both sectors can be increased. The cooperation of the two sectors constitutes the basis on which trust and networks between the relevant actors can be developed. This is not only important for the promotion and advancement of climate friendly technologies, but also for ensuring that in the long term the activities become independent from the implementing organization GIZ, which increases the likelihood of actors further cooperating after the completion of the project. To achieve this, it is helpful when locally already existing structures for knowledge development and cooperation can be accessed.





# Establishing local capacities for MRV implementation

<b>Activity</b>	Development and implementation of tailor-made sectoral GHG Inventory Systems
<b>Area</b>	Capacity building
<b>Country</b>	Turkey
<b>Project title</b>	Capacity development for the implementation of a monitoring, reporting and verification system (MRV) for greenhouse gas emissions in Turkey
<b>Duration</b>	2013 – 2018
<b>Partner institution</b>	Ministry of Environment and Urbanization of the Republic of Turkey
<b>Implementing organisation</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
<b>Contact</b>	Alexander Haack, alexander.haack@giz.de

## Summary

The overall objective of this project is to set up the whole infrastructure of a monitoring, reporting and verification system (MRV) for the greenhouse gas (GHG) emissions of the Turkish industry. This MRV system delivers data of the Turkish GHG emissions which can be used as a base for future mitigation activities such as the implementation of an emission trading system (ETS). In addition, sector-specific MRV guidelines for emissions producing branches of industry and additional legal frameworks for MRV were implemented. As part of the project, specialists working in public institutions and industrial sectors were provided with educational and training seminars on monitoring and reporting of GHG emissions. The project can be replicated in other countries that do not have an MRV system yet in place.

## Initial situation

At the beginning of the project, Turkey did not have any established procedures to track industrial greenhouse gas (GHG) emissions. Due to the international climate commitments and the newly established universal system of transparency under the Paris Agreement, Turkey decided to carry out this project to design a MRV system and to potentially lay the foundation for an ETS. The MRV system is based on a national regulatory framework which was adopted in 2012 and aligned with EU guidelines.

## Contribution to GHG mitigation

The project activities started with an analysis of different data management systems and the development of a tailor-made, web-based MRV data management system which already enabled industrial installations to submit their monitoring plans. This was followed by sector-specific training sessions on preparation of monitoring plans (cement, electricity generation, pulp & paper, iron & steel, etc. – one day per each of the ten sectors), various train-the-trainer workshops and study visits to the GHG related



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institutions such as the German Emission Trading Authority (DEHSt). The data management system for the submission of verified annual emission reports was accompanied by the launch of a related website, a booklet with sectoral calculation examples, the Annual Emission Reporting Guideline, the Verification Guideline and a number of additional trainings, seminars and communication events.

While this project does not directly contribute to GHG emission reductions, it provides the prerequisites to measure and verify the emissions in future, enlarges the capacity and creates awareness among the key stakeholders to reduce the emissions within the industrial sectors.

## Success factors/Replication potential

A significant factor for the success of the project has been the well-planned implementation process. The abovementioned project activities not only focused on the development of the web-based MRV system but put equal importance on the training and communication activities. The identification and involvement of all relevant stakeholders was a crucial success factor for this project.

Another important factor has been that the Ministry established a dedicated team in charge of all emission related topics, which has taken strong ownership and responsibility for the establishment and implementation of the MRV system. This facilitated to orchestrate the different implementation entities avoiding double or contradictory structures. Additionally, clear competencies at the contracting authority and a close relationship between the GIZ and the Ministry were established. Among others, a project person was seconded to the Ministry's office, ensuring a working relationship based on trust and flexibility through both informal communication and weekly project meetings.

The establishment of a training center (KAREM) under the Environmental Protection Foundation (TÜÇEV) of Turkey has been an important step for achieving the long-term and continued success of the trainings and measures taken. In addition, the project provides knowledge to the experts within the Ministry of Environment and Urbanization to manage and further develop the entire MRV system.

Overall, the Turkish MRV system is supposed to serve as an example in the region. The project approach and content can be well replicated in other countries, even if the web-based MRV data

management system will need to be customized to the specific circumstances. Providing a tailor-made system, potentially programmed in the respective country – as it has been done for Turkey – increases customer acceptance. Knowledge transfer on building up a proper MRV system has been initiated, mainly within the member countries of the Economic Cooperation Organization (ECO) and Partnership for Market Readiness (PMR).

The International Summer School “The Implementation and Enhancement of MRV System for GHGs and ETSSs” held in 2016 turned out to be a successful event where among other countries Afghanistan, Azerbaijan, Tajikistan, Morocco, South Africa, Iran, Turkish Republic Northern Cyprus, Pakistan, Tunisia and Ukraine participated. The side event at the COP22 in Marrakech raised further interest in MRV system implementation.

## Lessons learned

Having one clear partner on the beneficiary side combined with regular meetings at the beneficiary's premises facilitates a swift project implementation due to reduced coordination efforts. In order to ensure the acceptance of the concerned industries, it was also important to demonstrate that an MRV system actually presents an opportunity for companies rather than a burden.

The efforts of GIZ and the IKI program office to flexibly balance new requests with an initially defined scope have been recognized and may make a difference to projects with other implementing organizations. For instance, the establishment and support of the KAREM training facility utilized a political opportunity to institutionalize the long term efforts of the project.



This project has been selected as a good practice by the GIZ project “Policy dialogue and knowledge management on LEDS in the MENA region”. Within this framework, ten projects of the International Climate Initiative have been selected in total.

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# Facilitating access to international climate finance

<b>Activity</b>	Building and Transport NAMAs combined with a monitoring, reporting and verification system (MRV) for greenhouse gas emissions in Tunisia
<b>Area</b>	Capacity building
<b>Country</b>	Tunisia
<b>Project title</b>	Capacity building for GHG inventories and MRV in Tunisia
<b>Duration</b>	2012 – 2016
<b>Partner institution</b>	National Agency for Energy Conservation (ANME), Ministry of Local Affairs and Environment (MALE)
<b>Implementing organisation</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
<b>Contact</b>	Torsten Greis, torsten.greis@giz.de

## Initial situation

Tunisia developed a National Climate Strategy aiming to reduce GHG emissions but lacked of technical and institutional capacity for GHG monitoring and MRV which is required to benefit from international support for NAMA implementation. Until 2012, Tunisia had only commissioned two GHG inventories which were elaborated by external consultants. There were neither replicable MRV processes in place nor the necessary knowledge in the governmental institutions. In order to meet the national emission reduction targets and to report according to the UNFCCC regulatory, the Tunisian Government decided to build up the necessary capacity at the competent authorities as well as the respective companies to allow for a regular GHG monitoring and reporting.

## Contribution to GHG mitigation

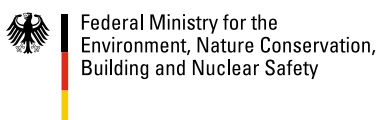
For the national inventory system about 25 public servants were trained in collecting and processing emission data. Data collection is based on available in-house data, official statistics as well as field surveys acknowledging the local conditions. While data return rates in major sectors such as cement were high, data needed to be extrapolated for other sectors with a large number of small



## Summary

This project supported the Tunisian Government in setting-up a national greenhouse gas (GHG) inventory system as well as a Measurement, Reporting and Verification System (MRV) for the Tunisian Building NAMA. It furthermore worked with ANME and the Municipality of Sfax on a regional Transport-NAMA approach for the city of Sfax. While a viable system to measure, report and verify the impact of NAMAs is a main prerequisite for obtaining international support for climate action, the lack of technical and institutional capacity for greenhouse gas monitoring and MRV was obstructing the successful implementation of activities. In the light of these challenges, the development of a robust GHG inventory for reporting under the UNFCCC as well as MRV systems for the individual NAMAs improves access to international climate finance and is well suited to be replicated in other countries.

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companies (e.g. brick production). Overall, the new GHG inventory system provides a reliable basis for successful reporting to the UNFCCC e.g. the 1<sup>st</sup> Biennial Update Report (BUR), and the development of Intended Nationally Determined Contributions (INDC).

Another innovative approach consisted of designing an MRV system for the Tunisian Building Nama with a special focus on the rooftop PV subsidy programme. In order to receive funding for PV installations, installers have to register and apply at the National Agency for Energy Conservation. So far all applications were manually handled through a paper-based process. The data management system installed achieved a reduction of processing time and effort by 67%.

At a later stage, an additional activity was added to the project which consisted of the design of a Transport-NAMA for the city of Sfax with more than 350,000 inhabitants. Through on-site measures and computer modelling, a local transport development plan was designed and analysed concerning the emission reduction potential of officially planned measures, including the construction of two new tram ways and three new fast bus lines. These activities are supposed to be the first element of a country wide Transport-NAMA in Tunisia. An MRV tool has been installed at the Municipality of Sfax to facilitate access to additional international climate finance for the implementation of the measures defined in the local transport development plan.

## Success factors/Replication potential

One of the success factors was the decentralized approach for the GHG inventory. The involved employees were dispersed over three ministries and three technical national authorities, requiring close collaboration. The public servants collecting the data were specialists in their respective sectors and could thus better assess data conformity than generalists.

In order to avoid lengthy definition processes, an international standard was applied for the Building-NAMA MRV-System (GHG Protocol Policy and Action Standard of the World Resources Institute). Trainings for the companies that deliver the data, e.g. through online videos which show how to fill out the required forms, are considered crucial for data consistency and smooth processing.

Future MRV or NAMA projects should also put emphasis on ensuring the collaboration between different government institutions which was a key success factor for the Tunisian project. Finally, the needs of the administrators who have to deal with the tools on a daily basis need to be well understood to avoid frustrations and achieve the expected process efficiencies. Many public administrations are short on staff, therefore any measure that saves time and effort is usually welcome.

## Lessons learned

An important point to be considered for future NAMAs in the housing or other sectors is to be aware of aspects of a MRV system which go beyond software and hardware, such as institutional structures, calculations, data sources and data provision, training, etc. – the project has shown that only if those points are duly addressed, the MRV system can be successful in the long-term.

Additional lessons learned from the transport NAMA are that the regional and national interlinkages in the transport sector have to be well considered in order to create a comprehensive and consistent tracking system and to avoid e.g. double counting. Therefore, local and national transport plans need to be synchronized to the most possible extent. The knowledge about complex mobility models may not be available on local level which can make the involvement of national or external experts necessary.

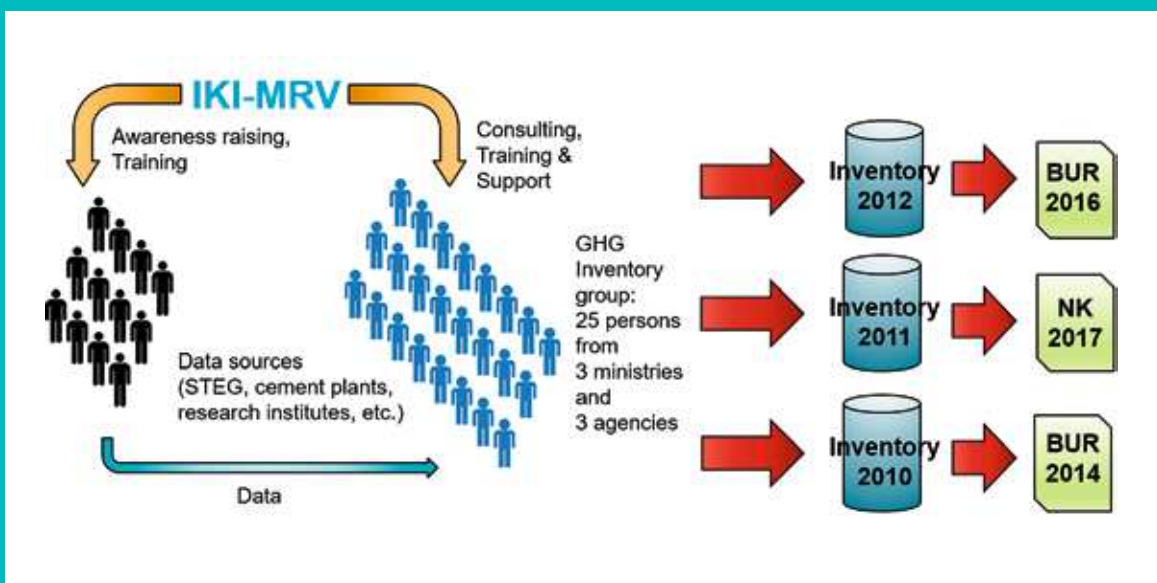


Figure 1:  
IKI-MRV Process

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# Saving electricity in industrial cooling processes

<b>Activity</b>	Installation and operation of solar cooling systems with natural refrigerants
<b>Area</b>	Energy Efficiency, Renewable Energy, Capacity Building
<b>Country</b>	Jordan
<b>Project title</b>	Solar Cooling for Industry and Commerce
<b>Duration</b>	2012 – 2017
<b>Partner institution</b>	Ministry of Environment
<b>Implementing organisation</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
<b>Contact</b>	Axel Ulmer, Axel.ulmer@giz.de

## Summary

Solar cooling systems deliver air-conditioning during the cooling period in summer, provide hot water and can further support the heating system during winter months. In regions with high solar radiation such as Jordan, this kind of system can lead to considerable savings in electricity costs and greenhouse gas emissions. The project consisted of four pilot systems proving the viability of the system as well as capacity building activities through cooperation with the Technical University of Berlin (TUB) and the German Jordan University (GJU).

## Initial situation

Jordan has a rapidly increasing demand for air-conditioning. Currently, the available technologies in Jordan and the Middle East are mostly chillers with low efficiencies, refrigerants with ozone or climate-damaging effects, and high leakage rates. Overall, cooling of commercial buildings in Jordan contributes to about

600,000 tons of CO<sub>2</sub> equivalent annually. At the same time, the country is one of the global locations with optimal conditions for the use of solar power in combination with air-conditioning systems. Absorption chillers, as the ones developed by the TUB for this project, make use of these climate conditions by profiting from solar energy to generate cooling and reducing the high amount of electricity required by conventional, compression-based cooling systems. In addition, the absorption heat pump also supplies useful heat for space heating or hot water production.

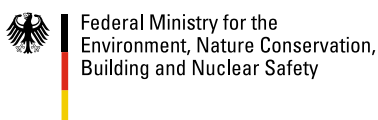
## Contribution to GHG mitigation

The project followed a multi-level approach in which technology was transferred through demonstration projects for solar cooling at four sites:

- German Jordan University (Madaba): Absorption chiller with a nominal cooling capacity of 160kW (avoiding 6,700 t of CO<sub>2</sub> emissions over the lifetime of the project), saving more than 4500 EUR electricity costs per month.



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- Irbid Chamber of Commerce: Absorption chiller with a cooling capacity of 50 kW.
- Petra Guest House: 388 m<sup>2</sup> solar field consisting of 114 compound parabolic concentrator (CPC) collectors supplying an absorption chiller with a cooling capacity of 160 kW.
- Royal Cultural Center (Amman): 160 kW absorption chiller with 132 CPC evacuated tube collectors.

The operation of the demonstration projects was augmented by a comprehensive monitoring system to collect reliable data, the development of recommendations for an improved sector strategy, and upscaling of solar cooling projects through respective regulations in Jordan and on a regional level.

The four solar cooling demonstration projects are expected to save about 20,000 t CO<sub>2</sub> equivalents over the lifetime of the systems. The projects have also contributed to economic, social, and ecological development by reducing expenses for fossil energy and cryogen costs leading to improved economic feasibility in the long-term. These projects were used to develop local capacities for planning, installation and maintenance. They were implemented in partnership with technology providers, local companies, research institutes and the public sector.

Moreover, the project has created the base for sustainable air conditioning in Jordan (and in the region) by installing and operating solar cooling systems with natural refrigerants, thus reducing direct and indirect GHG emissions of F-gases.

## Success factors/Replication potential

The cooperation with the research institutes (in this case TUB and GJU) has helped to build up local capacity, test and document the systems and their parameters and allows future training possibilities for interested suppliers.

In order to raise awareness of the cost saving potentials, the project has put further efforts into communication and outreach activities.

The replication potential for solar cooling systems is great in all MENA countries where hot summers and high irradiation levels are prevalent. The technology is available on a patent-free basis and can thus be used and applied by any interested private or public sector company.

## Lessons learned

The pilot projects were intended to demonstrate to the local private engineering sector the viability of alternative cooling options. However, as the technology is fairly complex and requires customization to the specific sites, it calls for a strong commitment of the stakeholders (suppliers and engineering firms) as well as a stable demand for such systems. In the Jordan context – but also likely in other countries – the public sector (schools, administration, hospitals, hotels) would be well suited to create this demand.

Building up local and on-site technical capacities for installation and maintenance as well as in research, production and services are crucial to ensure long-term functioning of the systems, create a robust supply chain and stable jobs. Providing financing support may be another way of increasing the interest of the sector and potential clients. It is also recommended to communicate the technology to different ministries and local administrations in order to raise interest in the cost saving potentials.





# Advancing sustainable consumption and production

<b>Activity</b>	Advancing and measuring sustainable consumption and production (SCP) for a low-carbon economy in newly industrialised countries (Advance SCP)
<b>Area</b>	Capacity Building
<b>Countries</b>	Morocco, Chile, Ethiopia, Peru (UN Environment), Indonesia, Malaysia, Philippines, Thailand (GIZ)
<b>Project title</b>	Advance SCP
<b>Duration</b>	2015 – 2018
<b>Partner institution</b>	Morocco: Ministry for Tourism
<b>Implementing organisation</b>	United Nations Environment Programme (UN Environment) Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
<b>Contact</b>	Beatriz Martins Carneiro (UN Environment), beatriz.carneiro@unep.org Thomas Lehmann (GIZ), Thomas.lehmann1@giz.de

nicate this to consumers through an environmental label. The focus in the GIZ-supported countries in South-East Asia is on eco-labels for consumer products and Green Public Procurement (GPP).

## Initial situation

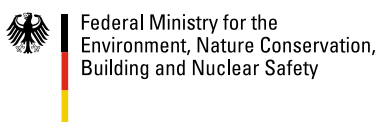
The non-existence of recognised labels and standards has been identified as a key barrier to enabling consumers and public administration to make informed decisions when choosing one product or service over another in many countries. Reasons are often the lack of SCP and GPP supporting policies, adequate legal framework and requirements, public awareness, and availability of eco-labelling systems with defined criteria.



## Summary

The project promotes sustainable consumption and production (SCP) patterns in eight emerging economies spread across South-East Asia, Africa and Latin America. It is implemented by UN Environment (Morocco, Chile, Ethiopia, Peru) and GIZ (Indonesia, Malaysia, Philippines, Thailand). The activities focus on strengthening institutions' capacities, providing technical training courses and drafting integrated policy solutions. The project takes the countries' needs and preferences into consideration: For instance, the UN Environment-led activities in Morocco aim to assess and improve the environmental performance of hotels, and commu-

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## Contribution to GHG mitigation

The project provides capacity building and training to ministries, public and private sector organizations, supports drafting standards, policies and regulations for SCP, with a focus on consumer information and Green Public Procurement, and assists as well in identifying opportunities to develop SCP related Nationally Appropriate Mitigation Actions (NAMAs). The project further contributes to the Consumer Information Programme of the UN's 10 Year Framework of Programmes on SCP (10YFP).

In Morocco, a methodology to assess the environmental impacts of hotels is adapted to the national context, to improve performance and to inform consumers through a label about the hotels' environmental footprint. Ten pilot hotels were selected, representing a range of different sizes and operations, i.e. large hotels, resorts, as well as small and medium sized businesses. They received technical assistance to assess their resource efficiency baseline and develop action plans. The criteria cover four areas: Impact on climate change (kg CO<sub>2</sub> /person per night), water consumption, non-renewable resources consumption, and percentage of products that are certified organic. The overall performance is indicated on a scale from A to E with A being the highest possible score. While the pilot phase with ten hotels is still ongoing, it is expected to achieve savings on water, energy and emissions of more than 20% in the first year after the implementation of the recommendations, representing 10% of operating costs.

## Success factors/Replication potential

A strong ownership of the country partners has been identified as key success factor. The Moroccan Ministry for Tourism, for instance, has actively involved other ministries and the hotel sector, and promoted the project at a specific side event at COP22 in Marrakesh. This event, in combination with a special tourism award, has received high attention from media and tour operators.

The project has also promoted South-South cooperation with other African countries to evaluate potential implementation of this label in the African tourism sector.

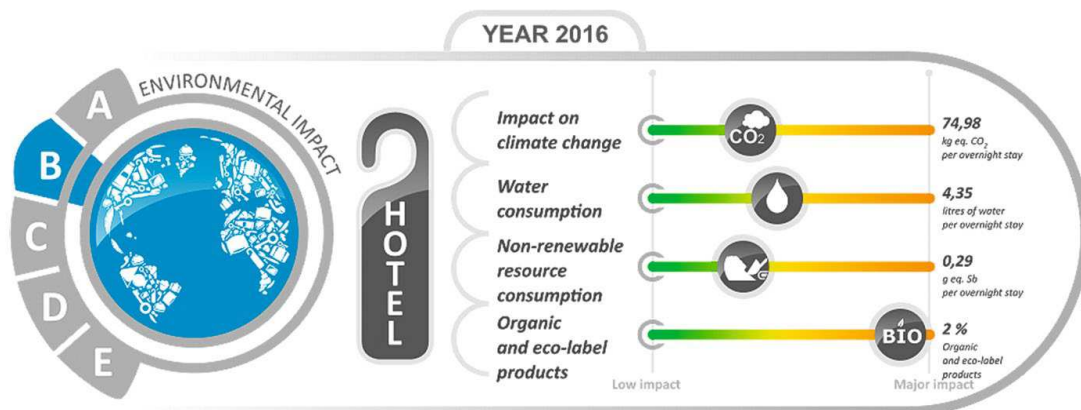
The leading role of public administration is also crucial to make green products such as efficient computers, lamps and appliances accessible to the average consumer. As those products tend to be more expensive, increasing the demand through public procurement can improve their market position and facilitate decreasing costs by economies of scale. Moreover, the public administrations enhance their images as forerunners in terms of sustainability and environmental friendly behaviour. In addition, by promoting the harmonisation of eco-labels, through cooperation with the Global Ecolabel Network (GEN) among others, the project creates regional and global markets for climate-friendly products and services and thus promotes trade, investments and new jobs.

## Lessons learned

The umbrella of the '10YFP', a global platform for action to support the achievement of the Sustainable Development Goals through the shift towards SCP in all countries, has also proven to be very valuable to the project. Its network of over 450 actors worldwide enables the project to interlink with existing expertise and resources, for instance through actors and projects of the Sustainable Tourism and the Consumer Information Programme in Morocco. Global working groups under this framework have evidently served to be a good mechanism for developing guidelines and tools in an inclusive consultation process. This has helped to ensure applicability on the ground and to build country ownership of the tools.

In Morocco, continued capacity building and knowledge sharing are considered crucial to ensure long-term success of the project. Hitherto, monitoring and evaluation required external expertise and national support to adapt actual solutions to local needs.

## Environmental impact of a night in Marrakech



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# Establishing a climate change competence centre in Morocco

<b>Activity</b>	Establishing a climate change competence centre to support national climate related activities
<b>Area</b>	Capacity Building
<b>Countries</b>	Morocco
<b>Project title</b>	National Competence Centre For Climate Change, Mitigation and Adaptation in Morocco
<b>Duration</b>	2013 – 2018
<b>Partner institution</b>	Moroccan Secretary of State in charge of Sustainable Development (former Ministry of Environment)
<b>Implementing organisation</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
<b>Contact</b>	Mohamed Boussaid, mohamed.boussaid@giz.de

## Initial situation

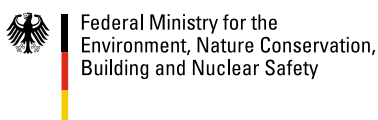
The project was initiated in 2013 with the objective of creating a climate change competence centre in charge of all climate relevant activities as an integrated unit within the Secretary of State for Sustainable Development. After further consultations with the government, civil society, the private sector and research institutions, the project's objective shifted towards establishing an independent, non-profit entity with an innovative legal status. The new entity/Centre has a status of "organisation serving the public interest" ("Groupement d'Intérêt Public", GIP), thus integrating more than 30 members from the public sector, civil society, the private sector, and research institutions. This new design allows for seamless cooperation, consultation, and information exchange between the members, and will further facilitate the complex interactions that resolving climate change issues requires.

## Summary

The IKI project "National Competence Centre for Climate Change 4C" was established to accumulate and concentrate climate change related knowledge and expertise and to accompany the set-up of a national climate competence centre. Flagship activities of the project in matters of technical assistance are the elaboration of Morocco's Nationally Determined Contributions to the fight against adverse effects of climate change (NDC Maroc) as well as the development of a National Green House Gas Inventory System. The project mainly provides capacity building, accompanying for example the Moroccan negotiating team for the COPs and organizing a wide range of trainings on the access to climate finance among many others. The project also supported the Moroccan COP22 Presidency in preparation of the climate summit held in Marrakesh in 2016. The project activities have since been transferred to the newly established organisation called "4C Maroc" in order to ensure continuity and to provide services beyond the project duration.



On behalf of



Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

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## Contribution to GHG mitigation

The 4C project supported the development of a GHG National Inventory System (NIS) as part of a global MRV system to be established and Morocco's INDC and NDC. Within the framework of the project, instruments of sustainable knowledge management for mitigation and adaptation, including trainings and information programs, were established. A website ([www.4c.ma](http://www.4c.ma)) was developed to inform and communicate on climate change. The site also hosts a national climate change expert data base as well as a self learning platform.

Strengthening the country's engagement and ambition in the climate negotiations, the project has provided training and technical support to the Moroccan Delegation, starting from COP19, with special assistance for the preparation of COP22 in Marrakesh. This included organizing high-level international conferences, workshops, expert meetings, and informal negotiations sessions.

The project contributed indirectly to GHG emission reductions, by providing the capacities and instruments allowing the identification of concrete mitigation projects. It developed the centres' business plan, internal procedures and supported staffing, enabling continuation of activities. Furthermore, it is supporting the government in designing and planning the NDC implementation.

## Success factors / Replication potential

A major success factor of this project was the supportive national context of interest for climate activities. The centre benefited from the strong commitment of the King of Morocco and the momentum of the COP22, representing an important milestone as a capacity building platform with an African outreach. The government had already aimed at promoting a carbon neutral economy beforehand, wherefore the Secretary of State had a strong interest in the project. In addition, the ratification of the Paris Agreement and the organization of COP22 in Marrakesh highlighted the importance of the activities carried out by the 4C.

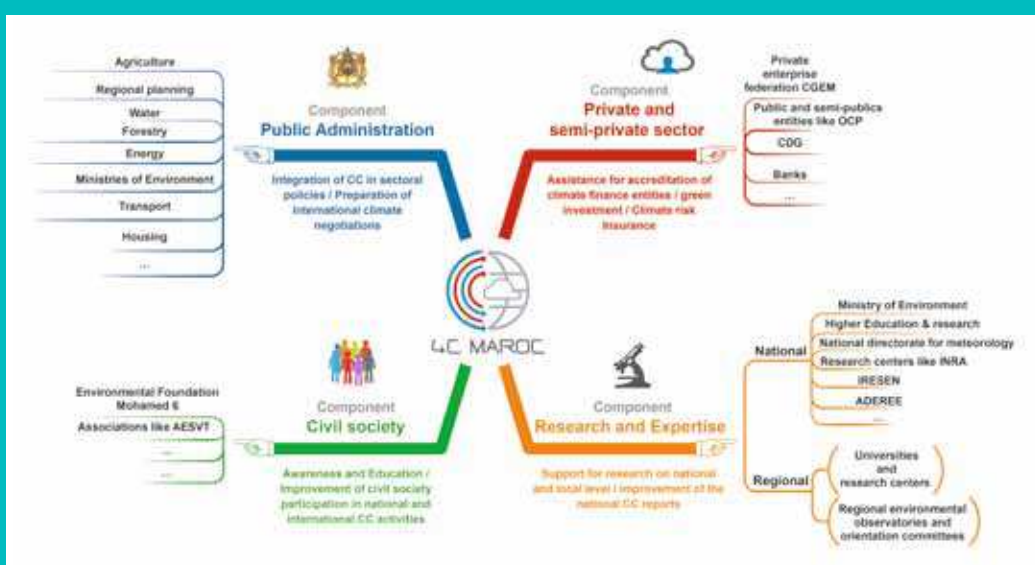
To replicate the successful implementation of a competence centre and the activities of this project in other countries, it is therefore crucial that strong political support, leadership and endorsement by the national partner are given. Moreover, as it was the case in Morocco, the development of a clear action plan should be based ideally on existing national strategies for green growth and carbon neutral development. In order to develop the appropriate instruments and trainings, the project team requires good knowledge of the national context.

Designation of clear processes, close coordination and constant communication with the different stakeholders are other key success factors. Finally, the flexible approach taken by the "IKI office" as donor organization was helpful as the activities could be adapted to the evolution of the project requirements driven by a changing local context.

## Lessons learned

During the creation of "4C Maroc" as an independent entity of public-interest, disagreement emerged as one partner preferred a different legal status for the new institution, stressing the advantages of integration of the centre into governmental structures. Eventually, the issue was resolved through a strong mobilization on the political level emphasizing that the centre does not intend to take over responsibilities of the participating organisations, but instead would complement their work by providing a platform of dialogue, knowledge exchange, and capacity building as well as offer new business opportunities.

The project puts a strong focus on continuously informing stakeholders and training of key partners to ensure ownership and the project's overall success. International and national experts working together and carrying out trainings and other activities facilitated a complementary, coherent and inclusive approach for increasing the level of knowledge and expertise on climate issues in Morocco.



Overview of the four components of the 4C Maroc

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